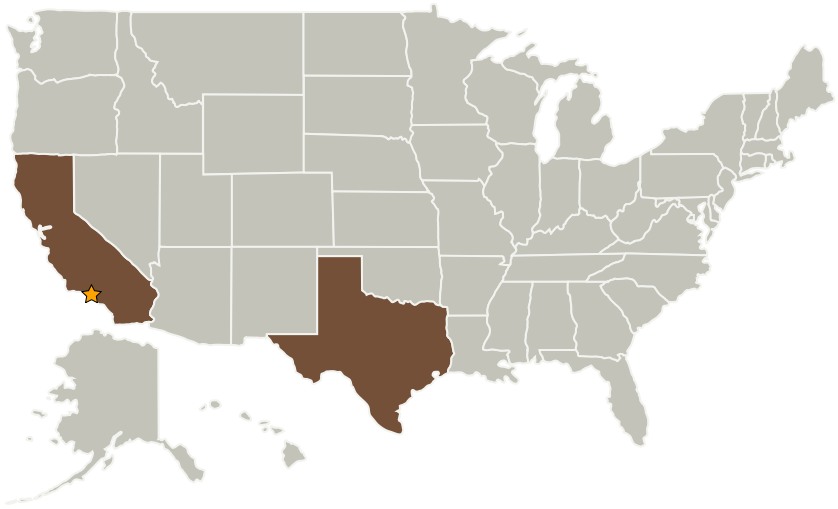
Intelligent Agents for Scheduling Space Communications, Phase II

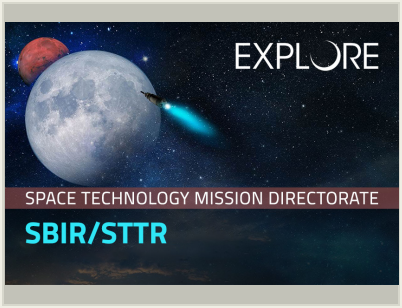
Completed Technology Project (2009 - 2012)

Project Introduction

The new exploration initiative, and the planned new antenna types to be developed in support of that initiative will increase the number and complexity of missions to be supported by the NASA Space Communications infrastructure. In a new concept, the communications architecture will evolve from the present centralized system to one where user/missions will be given direct control of communication schedules, allowing them to directly change requests, while working with other user/missions to solve scheduling conflicts in a collegial environment. A radically new user interface paradigm will be needed to support this new approach. It is our contention that such an interface is best designed using intelligent agent technologies, resulting in an intelligent space communications scheduling agent for each user/mission. In Phase 1 we demonstrated the feasibility of using the Distributed, Collaboration and Interaction (DCI) intelligent agent software to support key activities of user schedule representatives of the Deep Space Network (DSN). These agents used models of mission preferences for preparing requests and posting notifications, and took actions on the part of the user to resolve schedule conflicts and take advantage of unexpected asset availability. In Phase 2 we will extend our prototype agents to support the full range of user scheduling activities, to add capabilities to support multi-user conflict management and to design them to integrate with DSN Service Scheduling Software as it evolves to support user/missions. We will also investigate the potential of using software agents to support the space and ground networks.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Jet Propulsion Laboratory(JPL)	Lead Organization	NASA Center	Pasadena, California
TRACLabs, Inc.	Supporting Organization	Industry	Webster, Texas

Primary U.S. Work Locations	
California	Texas

Project Transitions

December 2009: Project Start

March 2012: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX10 Autonomous Systems
  - TX10.2 Reasoning and Acting
    - TX10.2.2 Activity and Resource Planning and Scheduling